REMARKS

I. Introduction

In response to the pending Office Action, Applicant has amended claims 1, 6, 8, 9, 10 and 11 and added new claim 12 so as to clarify the intended subject matter of the present invention. Support for new claim 12 can be found on page 3, lines 7-22 and page 9, lines 8-11 of the specification. No new matter has been added.

For the reasons set forth below, Applicant respectfully submits that all pending claims are patentable over the cited prior art.

II. The Rejection Of Claim 1 Under 35 U.S.C. § 102

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by Huber (U.S. 4,868,133). Applicant respectfully submits that Huber fails to anticipate the pending claim for at least the following reasons.

With regard to the present invention, claim 1 as currently amended recites in part that the first and second thermal treatments are sequentially performed in the same heating apparatus. In contrast to the claimed invention, Huber discloses that the first thermal treatment is performed in the furnace and the second thermal treatment is performed using a lamp. Therefore, the first and second thermal treatments are not sequentially performed in the same apparatus as recited by amended claim 1 by Huber. Accordingly, at a minimum, Huber fails to disclose the foregoing limitation recited by amended claim 1. As such, it is clear that Huber does not anticipate claim 1, as amended, or any claim dependent thereon.

III. The Rejection of Claim 10 Under 35 U.S.C. § 102

Claim 10 was rejected under 35 U.S.C. § 102(b) as being anticipated by Aoki (U.S. 4,994,399). Applicant respectfully submits that Aoki fails to anticipate the pending claim for at least the following reasons.

With regard to the present invention claim 10 as currently amended recites in part that the semiconductor substrate having gettering sites composed of a bulk microdefect layer at a predetermined depth from the surface of the semiconductor substrate, but has no denuded zone in an upper portion thereof. In contrast to the claimed invention, Aoki discloses in col. 1, line 49 a gettering layer covered with a surface denuded zone formed in the wafer by performing a third thermal treatment. Thus, Aoki discloses a denuded zone formed in the upper portion of the substrate.

As anticipation under 35 U.S.C. § 102 can only be found when the reference discloses exactly what is claimed, *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), for the foregoing reasons it is respectfully submitted that Aoki does not anticipate amended claim 10 of the present invention.

IV. The Rejection Of Claim 6 Under 35 U.S.C. § 103

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Huber in view of Gardner et al. (U.S. 5,795,809). This rejection is respectfully traversed for the following reasons.

With regard to the present invention, the step of performing a thermal treatment on the semiconductor substrate such that metal impurities are diffused to gettering sites is performed after forming an isolation film. In contrast to the claimed invention, Gardner et al. discloses that

the anneal step (thermal step) is performed prior to the step of forming the field oxide (isolation film). Thus, after the field oxide forming step, no gettering site (precipitation) is formed. Huber is silent with respect to the aforementioned steps, and therefore does not cure the deficiencies of Gardner.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974). In the instant case, all the claim limitations are not taught or suggested by the prior art and thus, the pending rejection does not establish *prima facie* obviousness of the claimed invention. Therefore, it is submitted that the combination of Huber in view of Gardner does not render the present invention, as amended, unpatentable.

V. The Rejection Of Claim 8 Under 35 U.S.C. § 103

Claim 8 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Huber in view of Falster et al. (U.S. 5,403,406) and further in view of Aoki.

With regard to the present invention as recited by amended claim 8, the semiconductor substrate has gettering sites composed of a bulk microdefect layer formed at a predetermined depth from the surface of the semiconductor substrate by performing the first and second thermal treatments, but has no denuded zone in the upper portion of the substrate. In contrast to the claimed invention, both Falster and Aoki disclose the subjecting of wafers to a third thermal treatment, thereby forming a denuded zone in the upper portion of the wafer. As such, both Aoki and Falster et al. disclose forming a denuded zone in the upper portion of the substrate.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA

1974). Therefore, as each of the cited references disclose forming a denuded zone in the upper portion of the wafer, it is respectfully submitted that the combination of Huber, Falster et al. and Aoki does not render claim 8, as amended, unpatentable.

VI. The Rejection Of Claims 9 And 11 Under 35 U.S.C. § 103

Claims 9 and 11 were rejected under 35 U.S.C. § 103 as being unpatentable over Huber in view of Falster et al. in view of Aoki and further in view of Miyashita et al. (U.S. 5,951,755). Applicant respectfully traverses the rejection for the following reasons.

With regard to the present invention, claims 9 and 11 as amended recite in part that nitrogen atoms that function as precipitation nuclei of the gettering sites are added to the semiconductor substrate. In contrast to the claimed invention, Miyashita discloses a gettering process in which the gettering sites are formed of oxygen precipitations resulting from the precipitation of oxygen contained in a silicon substrate. There is no disclosure or suggestion in any of the cited prior art references of the use of nitrogen atoms as precipitation nuclei for the formation of gettering sites. Accordingly, at a minimum, the combination of Huber in view of Falster et al. further in view of Aoki and further in view of Miyashita et al. fails to disclose the foregoing limitation recited by amended claims 9 and 11. Therefore, it is submitted that claims 9 and 11, as amended, are patentable over the prior art.

VII. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*,

819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1, 6, 8, 9, 10 and 11 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

VIII. Request For Notice Of Allowance

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: August 26, 2005